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Enteral Nutrition In Intensive Care: 'Tiger Tube' – For Small Bowel Feeding In Acute Pancreatitis. Case Report

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ABSTRACT

Nutritional support is vital in improving the clinical outcomes of the critically ill patients. Almost all published guidelines regarding nutritional support in the critically ill recommend the use of enteral nutrition over parenteral nutrition. In acute pancreatitis, trial of enteral feeding should be given into the small bowel. The success rate of small bowel feeding tube is highest if inserted endoscopically. In this case report, a simple bedside procedure which did not require endoscopic feeding tube placement offered a good alternative. Self advancing small bowel feeding tube, Tiger tube was inserted successfully to provide nutritional support in moderately severe acute pancreatitis.

KEY WORDS: *acute pancreatitis, enteral nutrition, small bowel feeding, Tiger tube.*

CASE REPORT:

A thirty-eight years old man was admitted to the hospital with fever, vomiting and epigastric pain. He has a past history of cholelitiasis which was diagnosed a few months prior to admission but he missed follow up and the planned management. He was diagnosed to have acute pancreatitis due to a very high serum amylase level (2169 IU per liter) and this diagnosis was then confirmed by CT scan abdomen with contrast. He was admitted to an intensive care unit (ICU) for intensive monitoring due to high Ranson prognostic criteria (≥ 3) for acute pancreatitis. On admission to the ICU, he was tachypneic with respiratory rate of more than 35 per minute, and required high flow Oxygen therapy to maintain oxygen saturation, SpO2 ≥ 92%.

Radiology findings are:
a) CT abdomen revealed a swollen pancreas with ill defined non enhancing

hypodense areas within the head and body which was about 50% and also the presence of peripanreatic fluid. Diagnosis was acute pancreatitis with areas of necrosis.

b) Chest X-Ray revealed bilateral pleural effusions with bilateral collapsed consolidations at both lower lobes.

He was managed in the ICU with adequate supportive therapies without the need for endotracheal intubation and mechanical ventilation. Enteral nutrition was started on the second day of ICU admission and 80% target calories achieved within 48 hours after initiation of feeding. The self advancing nasojejunal tube, Tiger Tube was inserted successfully by the intensive care specialist. (Figure 1)

Figure 1 The Tiger Tube in place

DISCUSSION

In critically ill patients, nutritional support is now considered to be the standard of care as it improves patient outcome based on the rationale that malnutrition is associated with increased morbidity and mortality. The benefits of nutritional support which can be either in the form of either enteral nutrition (EN) or parenteral nutrition (PN) include improved wound healing, decreased catabolic

response to injury, improved clinical outcomes and reduction in complication rates. Published guidelines regarding nutritional support in the ICU recommend the use of EN rather than PN because there is good evidence that EN associated with better clinical outcomes. PN is more expensive and associated with more infectious complications [1].

Acute pancreatitis is defined as an acute inflammatory process of the pancreas, with variable involvement of other regional tissues or remote organ systems. In 10-15% of cases the disorder is life threatening with management of the disorder requiring admission to an intensive care unit. Specific treatment for acute pancreatitis currently does not exist and management is still supportive, with therapy aimed at reducing pancreatic secretion, replacing fluid and electrolyte losses and analgesia [2]. The provision of nutritional support in moderate to severe acute pancreatitis is an essential component of supportive therapy since many patients with acute pancreatitis are nutritionally depleted prior to their illness and face increased metabolic demands throughout the course of their disorder. Failure to reverse or prevent malnutrition increases mortality rate. In acute pancreatitis, nutrition is maintained using PN although EN (using a nasojejunal tube) has been found to be just as effective [3]. Recent meta-analyses of six randomized trials involving a total of 263 patients demonstrated improved outcomes with EN, including decreased rates of infection, surgical intervention, reduced length of stay and reduced costs [4]. The United Kingdom guidelines and expert panel of the American Thoracic Society favor the use of EN over PN in patients with severe acute pancreatitis whenever possible [5, 6]. Therefore, nasoenteric feedings should be recommended for most patients with severe pancreatitis.

Endoscopically placed nasojejunal tube can be difficult to place and need the expertise of an endoscopist. In many hospitals in Malaysia, this service is not always available. In addition, the logistical and cost considerations of arranging the endoscopist to perform the procedure can make this technique less than optimal in many hospitals. Therefore the usage of nasojejunal route is low and this is in contrary to the clinical practice guidelines as a Canadian multidisciplinary committee recently recommended that small bowel feeding should be routinely used [7]. The possible advantages of small bowel feeding are; it allows a greater percentage of the patient's caloric requirements to be met by reaching the goal rate more quickly, it might lower the rate of regurgitation and aspiration, therefore lead to a lower incidence of nosocomial pneumonia. The negative point is that it can be difficult to insert and this leads to a delay in the commencement of EN [8].

In this case report, the goal of patient's caloric requirement was met early via insertion of self-advancing nasojejunal tube for small bowel feeding. Trial of EN was successful and it was tolerated well. He was discharged from the ICU seven days later and the tube was removed ten days post insertion. We used the frictional nasojejunal feeding tube, (Tiger tube, Frictional nasal jejunal Feeding Tube, Cook Critical Care, Bloomington, IN, USA). This tube appears to provide the combination of simplicity and high insertion success rates [9]. Tiger tube is 14 French tube, 155 cm long, features innovative flaps (or barbs) that facilitate placement into the jejunum by allowing peristalsis to gently drag the catheter into the small bowel. Its unique alternating flaps also prevent feeding tube dislodgment.

Insertion of Tiger Tube:

Once the tube position is confirmed in the stomach (~ at 50cm), the tube is advanced at 10 cm every hour until 100 cm mark is reached. An X-ray is then performed. If the position is confirmed to be post pyloric (Figure 2), feeds are initiated and another abdominal x-ray can be performed again after 24 hours.

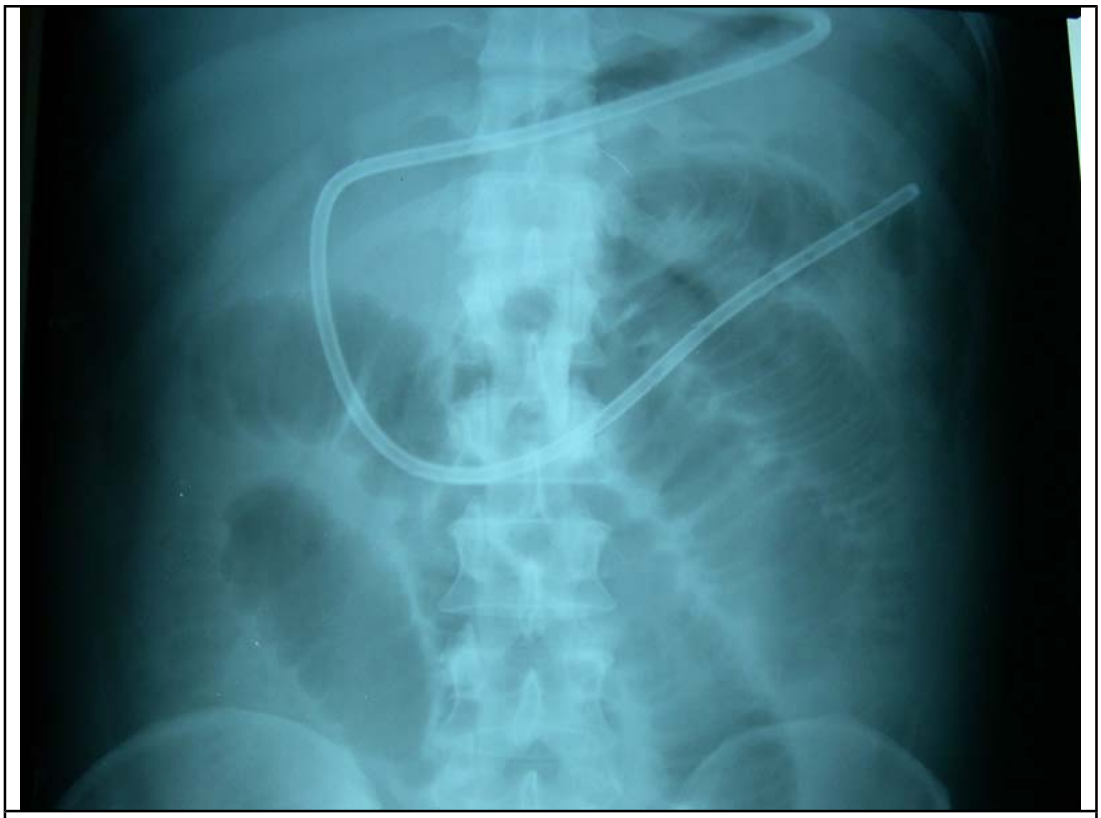

Figure 2. Abdominal X-Ray was taken at 6 hours post insertion of tube. This confirmed the position to be at post pyloric

CONCLUSION

In critically ill patients, early EN is associated with improved outcomes. A number of comparisons of EN with PN have been made in mild and severe acute pancreatitis, all suggesting that EN is well tolerated without adverse effects on the course of the disease. The recent development of 'self-migrating' Tiger tube is a promising alternative to endoscopically-placed nasojejunal tube. This eliminates the need of endoscopy with its costs and logistic difficulties. The aggressive approach to commence EN would improve outcome in critically ill patients and avoid complications associated with PN. Bedside clinicians can pass the tube into the stomach (which takes around 5-10 minutes) and then wait for the tube to migrate into the jejunum over the next 6-12 hours. This simple procedure potentially reduces the financial and manpower resources implicated in managing critically ill patients. Since it may lower the rate of regurgitation and aspiration, the incidence of ventilator-associated pneumonia can be potentially reduced.

REFERENCES:

1. Heyland D, Mac Donald S, Keefe L. Total parenteral nutrition in the critically ill patient. A meta-analysis. JAMA 1998, 280: 2013-19.
2. Uhl W, Washaw A, Imrie C, et al. International Association of Pancreatology. IAP Guidelines for the Surgical Management of Acute Pancreatitis. Pancreatology 2002; 2: 565-573.
3. Mitchell RMS, Byrne MF, Baillie J. Pancreatitis. Lancet 2003; 361: 1447-1455.
4. Marik PE, Zaloga GP. Meta-analysis of parenteral nutrition versus enteral nutrition in patients with acute pancreatitis. BMJ 2004; 328:1407.
5. Working Party of the British Society of Gastroenterology, Association of Surgeons of Great Britain and Ireland, Pancreatic Society of Great Britain and Ireland, Association of Upper GI Surgeons of Great Britain and Ireland. UK guidelines for the management of acute pancreatitis. Gut 2005; 54: Suppl 3.
6. Nathens AB, Curtis JR, Beale RJ, et al. Management of the critically ill patient with severe acute pancreatitis. Crit Care Med 2004; 32:2524-36.
7. Heyland DK, Dhaliwal R, Drover JW, et al: Canadian clinical practice

guidelines for nutrition support in mechanically ventilated, critically ill adult patients. J Parenter Enteral Nutr 2003, 27: 355-37

8. Neuman DA, De Legge MH: Gastric versus small bowel feeding in the intensive care unit: a prospective comparison of efficacy. Crit Care Med 2002, 30:1436-1438.
9. Oxford N, Davies AR, Marshall K, Cooper DJ, Scheinkestel CD, Tuxen DV (2004). The new frictional nasojejunal tube: a high success rate in achieving small bowel placement in critically ill patients. Proceedings of the 29th Australian and New Zealand Scientific Meeting on Intensive Care, page 53 (abst).

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